

ABSTRACT

THE EFFECT OF PEPPERMINT ESSENTIAL OIL ON THE CHARACTERISTICS AND (THERMAL CYCLE) PHYSICAL STABILITY OF NANOSTRUCTURED LIPID CARRIER COENZYME Q10 SYSTEM

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Coenzyme Q10 (CoQ10) is an antioxidant that has a high lipophilicity ($\log P > 10$) which can cause a problem when formulated in topical dosage forms. Nanostructured Lipid Carrier (NLC) is a combination of liquid solid lipid that can overcome this problem. In previous studies, NLC-CoQ10 had lower penetration compared to NE-CoQ10 so the NLC requires an additional component that can increase CoQ10 penetration through the skin, one of which is an enhancer. This study uses peppermint essential oil (PEO) as an enhancer. The addition of PEO also increases the liquid lipid component ratio of the NLC-CoQ10 system. The purpose of this study was to see the effect of adding PEO (1.0%; 1.5%; 2.0%) on the characteristics and physical stability of the NLC-CoQ10. Evaluation characteristics included organoleptic, pH, particle size, PI, and zeta potential. The physical stability test was carried out on the thermal cycle test based on color, odor, consistency and separation. From the additional characteristic test results, the addition of PEO (1.0%; 1.5%) decreases the zeta potential value and PEO (1.0%; 1.5%; 2.0%) increases physical stability NLC-CoQ10. The addition of PEO (1.0%; 1.5%; 2.0%) on the NLC-CoQ10 has a small particle size F1, F2, F3 and F4 (188.25 ± 13.22 nm; 197.8 ± 14.19 nm; 190.90 ± 9.47 nm; and 187.5 ± 8.71 nm), a low PI F1, F2, F3 and F4 (0.203 ± 0.03 ; 0.114 ± 0.12 ; 0.232 ± 0.05 ; and 0.219 ± 0.08), a potential zeta value greater than -30 mV and physically stable to temperature fluctuations.

Keywords: Coenzyme Q10, NLC, Peppermint essential oil, Enhancer, Thermal cycle physical stability